

27. If  $g(x) = 3|x-1|$  and  $f(x) = |x|$ , describe the transformation from  $f(x)$  to  $g(x)$ .

narrower  $\uparrow$  right  $\uparrow$  absolute value  
3 unit

$f(x) = |x|$  is the parent function

$g(x)$  is moved 1 unit to the right and the 3 made it narrower (vertical compressed)

28. Find the equation of the axis of symmetry of the graph:  $y = -2x^2 + x - 1$

$$x = \frac{-b}{2a}$$

$$a = -2, b = 1, c = -1$$

$$x = \frac{-1}{2(-2)} = \frac{-1}{-4} = \frac{1}{4}$$

$$x = \frac{1}{4}$$

29. Sasha wants to make the most money she can while maintaining a 90 average. Currently she makes \$9.00 per hour at her job. She knows she can maintain a 100 average if she does not work at all. She has observed that for every two hours of work, her average goes down by one point. How much money can she make each week while still maintaining a 90 average?

$$4x \quad a_n = -\frac{1}{2}n + 100$$

hr	100
1	99
2	98
3	
4	98

$$90 = -\frac{1}{2}n + 100$$

$$\frac{-100}{-10} = \frac{-\frac{1}{2}n}{-10} - 2$$

$$m = \frac{-1}{2}$$

$$b = 100$$

$$20 = 17 \text{ hrs}$$

$$g(20) = \$180$$

30. Sam's profit after a year of selling custom bicycles that he has created can be represented by the function  $f(x) = 325x - 1000$ .

Complete the accompanying table that represents his profits from the past year.

In which month of the year did he begin to make a profit?

the 4th month or April.

x	f(x)
1	-675
2	-350
3	-25
4	300
5	625
6	950
7	1275
8	1600
9	1925
10	2250
11	2575
12	2900

Answer one question in this part. The correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in the spaces provided. [6]

35. Dana went shopping for plants to put in her garden. She bought three roses and two daisies for \$31.88. Later that day, she went back and bought two roses and one daisy for \$18.92.

If  $r$  represents the cost of one rose and  $d$  represents the cost of one daisy, write a system of equations that models this situation.

$$\begin{aligned} 3r + 2d &= 31.88 \\ 2r + d &= 18.92 \end{aligned}$$

Use your system of equations to algebraically determine both the cost of one rose and the cost of one daisy.

$$\begin{array}{r} 3r + 2d = 31.88 \\ -2(2r + d = 18.92) \\ \hline 3r + 2d = 31.88 \\ -4r - 2d = -37.84 \\ \hline -r = -5.96 \\ r = \$5.96 \end{array}$$

$$\begin{array}{r} 2(5.96) + d = 18.92 \\ 11.92 + d = 18.92 \\ -11.92 \quad -11.92 \\ \hline d = \$7 \end{array}$$

If Dana had waited until the plants were on sale, she would have paid \$4.50 for each rose and \$6.50 for each daisy. Determine the total amount of money she would have saved by buying all of her flowers during the sale.

$$\begin{array}{r} 31.88 \\ + 18.92 \\ \hline 50.80 \end{array}$$

$$\begin{array}{r} \text{rose} \\ 5(4.50) = 22.50 \\ \text{daisy} \\ 3(6.50) = 19.50 \\ \hline 42 \end{array}$$

$$50.80 - 42 = \$8.80$$

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